ISSN (print) 0093-4666 © 2011 Mycotaxon, Ltd. ISSN (online) 2154-8889

MYCOTAXON

Volume 116, pp. 481–490 *April–June 2011*

DOI: 10.5248/116.481

Fungal nomenclature.

1. Melbourne approves a new Code

Lorelei L. Norvell

Secretary, IAPT Nomenclature Committee for Fungi,
Pacific Northwest Mycology Service, Portland, OR 97229-1309 USA

Correspondence to: *llnorvell@pnw-ms.com*

Abstract— The 18th International Botanical Congress, held in Melbourne, Australia, during July 2011, ratified several sweeping changes that will affect fungal nomenclature for years to come. Proposals to amend the Vienna Code were approved by the Nomenclature Section during the first week (July 18–22) and ratified by the entire IBC on the final day (July 30). Of particular interest to mycologists are a new title (International Code of Nomenclature for algae, fungi, and plants), radical modification of Article 59 establishing the principle of 'one fungus : one name', valid publication using English descriptions or diagnoses and effective electronic publication (both effective on January 1, 2012), required deposition of fungal names in a recognized repository, clarification of the orthography and typification of sanctioned names, exclusion of microsporidians and other organisms treated in other Codes, and recommendations regarding designation of type cultures. Acceptance of recommendations of the Nomenclature Committee for Fungi and new appointments are also briefly discussed.

Introduction

Fungal names have been governed by a 'botanical' code since 1867, when the first set of nomenclatural rules, De Candolle's 64-page Lois de nomenclature botanique, was formally adopted at an international botanical congress in Paris. Diverse interpretations revealed the urgent need for major revision which was accomplished at the second formal International Botanical Congress in Vienna in 1905 (the first IBC was in Paris in 1900) to form the International Rules of Botanical Nomenclature, informally known as the Vienna rules.

Since 1905, botanical congresses have convened 16 times (1910, 1926, 1930, 1935, 1950, 1954, 1959, 1964, 1969 and thereafter every six years). Since the VII IBC in Stockholm in 1950, nomenclature sessions have been held at each Congress for the express purpose of revising each previous Code. Thus, even as the recent Vienna Code (McNeill & al. 2006) replaced the St Louis

Code (Greuter & al. 2000), soon the newly ratified and yet to be published Melbourne Code will supersede all previous botanical codes.

The revolutionary 2011 IBC Nomenclature Section at Melbourne might well be regarded — at least by Mycotaxon readers — as the "Mycological Section" because so many of the sweeping changes proposed by mycologists were accepted. Among the more noteworthy (to be treated in more detail) are accepting names of new taxa with either Latin or English descriptions or diagnoses as validly published, clarifying that sanctioned names are to be lectotypified (not neotypified) from elements associated with the name in the original and/or sanctioning treatments, and requiring deposition of fungal names in a recognized repository for valid publication. Most controversial — and undoubtedly with the most far-reaching effects for fungi — is the radical revision of Article 59 to establish the principle of one name for one fungus. Not proposed by mycologists (but definitely supported by them) is the adoption of effective electronic publication of names.

The change of title from the International Code of Botanical Nomenclature to the International Code of Nomenclature for algae, fungi, and plants is particularly significant, in that only one phycologist and 13 mycologists were among the 201 delegates to the formal Nomenclature Section. Section President Sandra Knapp (Natural History Museum, London, UK), Rapporteur-général John McNeill (Royal Botanic Garden Edinburgh, UK), and Vice-rapporteur Nick Turland (Missouri Botanic Garden, USA) presided over the July18–22 proceedings. Mycologists attending were Francisco Bellù (Italy), J.C. Coetzee (South Africa), Walter Gams (Netherlands), Peter Johnston (New Zealand), and James Lendemer (USA) and Nomenclature Committee for Fungi (NCF) members Lee Crane (USA), Chair Vincent Demoulin (Belgium), David Hawksworth (Spain, UK), Paul Kirk (UK), Tom May (Australia), Secretary Lorelei Norvell (USA), Shaun Pennycook (New Zealand), and Scott Redhead (Canada).

The new amendments are summarized below, with the texts of two floor proposals presented in their entirety.

Naming the Code that governs fungal nomenclature

Five proposals by Hawksworth & al. (2009; Taxon 58: 658–659) sought to clarify that *Fungi*, often regarded as belonging to the same superkingdom as *Animalia*, are still covered by the ICBN. The majority voting at last year's Edinburgh International Mycological Congress (IMC; see Norvell & al. 2010, Mycotaxon 113: 503–504, 510) as well as a strong majority of the 14 NCF members supported changing the ICBN title and adding more fungal references within the Code proper. Less enthusiasm was shown, however, for permitting decisions on proposals relating solely to fungi to be taken at an IMC (Norvell 2011: Taxon 60: 610).

The first two proposals were accepted by the Melbourne delegates with minimum controversy, somewhat amazing the attending mycologists. In its first vote to amend the Code after convening, the delegates agreed on Monday (July 18) to rename the code to the International Code of Botanical, Mycological, and Phycological Nomenclature (ICBMPN?). Upon reflection, however, many found the new title clumsy and overly '-ological'. Therefore, at the urging of new IAPT President Vicki Funk, NCF Secretary Norvell agreed to reopen the matter on Friday, July 22, by presenting from the floor the 'Norvell & Funk' proposal to modify the title to the International Code of Nomenclature for algae, fungi, and plants (ICN), which passed overwhelmingly. The second Hawksworth & al. proposal, originally to replace plant/s by plant/s or fungus/i throughout the code, was approved as amended from the floor to replace "plant/s" by "organism/s" throughout where appropriate.

The three remaining 'governance' proposals were referred to a Subcommittee on governance of the Code with respect to fungi, operating within the newly established Special Committee on by-laws for the Nomenclature Section. Given that most of the mycological proposals were passed as mycologists wished, it is clear that fungi are clearly granted equal status with the other organisms (including plants) governed by the Code.

Article 59 —> "One fungus : one name"

Article 59, governing the nomenclature of fungi with a pleomorphic life cycle, has long been a source of dissension within the mycological community, as can best be seen from "The 'Amsterdam Declaration'" (pp. 491–500 following) and the "Critical Response to the Amsterdam Declaration" (pp. 501–513 following; see also Norvell 2011, Taxon 60: 613). Although Art. 59 had been scrutinized thoroughly by the Special Committee on the Nomenclature of Fungi with a Pleomorphic Life Cycle (Redhead 2010, Taxon 59: 1843–1852), the mycological community still had reached no consensus regarding how best to address the separate names for sexual and asexual forms by the opening day in Melbourne.

Scott Redhead (Secretary of the Special 'Art. 59' Committee), in consultation with representatives of both sides, managed to forge a series of 'floor' proposals, the most extreme being Option 1 and with Option 2 being slightly less radical and Option 3 the most moderate. On July 21, Redhead announced withdrawal of 18 published proposals before proposing from the floor Option 1, deletion of Art. 59. Discussion was extensive and — to those sitting in the audience — seemed inconclusive. Nonetheless the vote to accept that option was swift and definite, leaving the mycologists in the hall blinking and a bit stunned. With its passage, the two other options were not considered.

As amended during discussion and omitting minor amendments of existing articles and corollaries to be handled by the Editorial Committee, Option 1 reads:

Replace Article 59 with:

Art. 59.1 On and after 1 January 2013, all names of fungi, including fungi with mitotic asexual morphs (anamorphs) as well as a meiotic sexual morph (teleomorph), must conform to all the provisions of this Code that are not restricted in application to other groups of organisms or from which names of fungi are not specifically excluded.

Note 1. Previous editions of this Code provided for separate names for so-called "form-taxa", asexual forms (anamorphs) of certain pleomorphic fungi, and restricted the names applicable to the whole fungus to those typified by a teleomorph. All legitimate fungal names are now treated equally for the purposes of establishing priority, regardless of the life history stage of the type.

Art. 59.2. Names published prior to 1 January 2013 for the same taxon of non-lichenized *Ascomycota* and *Basidiomycota* with the intent or implied intent of applying to, or being typified by separate morphs (e.g., anamorph, synanamorph or teleomorph) are not considered to be alternative names under Art. 34.2; nor are they to be treated as nomenclaturally superfluous under Art. 52.1. If they are otherwise legitimate, they compete in providing the correct name for the taxon under Art. 11.3 and 11.4.

Add new Article 14.n

Art. 14.n. 14.n. For organisms treated as fungi under this Code, lists of names may be submitted to the General Committee, which will refer them to the Nomenclature Committee for Fungi for examination by subcommittees established by that Committee in consultation with the General Committee and appropriate international bodies. Accepted names on these lists, which become permanent as Appendices XX–YY once reviewed by the Nomenclature Committee for Fungi and the General Committee, are to be listed with their types together with those competing synonyms (including sanctioned names) against which they are treated as conserved. For lists of rejected names see Art. 56.n.

Add to Art. 56 (new)

(specifically referred to the Editorial Committee for wording and placement)

Art. 56.n. For organisms treated as fungi under this Code, lists of rejected names may also be included in the Appendices established under Art. 14.n. Such names are to be treated as though rejected outright under Art. 56.1 and may become eligible for use only by conservation under Art. 14.

Add a new paragraph to Art 57

Art. 57.2. In pleomorphic fungi, in cases where, prior to 1 January 2013, both teleomorph-typified and anamorph typified names are widely used for a

> taxon, an anamorph-typified name that has priority must not be taken up until retention of the teleomorph-typified name has been considered by the General Committee and rejected.

The above was accepted in principle and will be revised as appropriate by the Editorial Committee prior to publication of the Melbourne Code in 2012. Art. 59 Prop. A. (as Prop. 306 in Redhead 2010, Taxon 59: 1929) to change the title of Chapter VI to "Names of **Anamorphic Fungi** or Fungi with a Pleomorphic Life Cycle" and not part of the withdrawn package also passed with strong support.

Subsequent to acceptance of the proposals on fungi with a pleomorphic life cycle, the following modifying proposal by James Lendemer (New York Botanic Garden) from the floor was also accepted:

> *14.n[bis]*. Lichenized fungi, and those fungi traditionally associated with them taxonomically (e.g. *Mycocaliciaceae*, but not lichenicolous fungi), are exempt from the newly accepted provisions in Arts. 14.n, 56.n, and 57.2.

The 'one fungus — one name' change will cheer many mycologists while depressing others. Nonetheless, all must work together to determine how best to ease the transition to the new Art. 59. To that end, the Nomenclature Committee for Fungi and International Commission on the Taxonomy of Fungi are working together to establish the subcommittees for evaluating which names to retain and are making arrangements for numerous upcoming symposia on these evaluations.

Interestingly, fungi are not alone: fossil nomenclature has undergone a similar transformation, as noted by McNeill (2011, BEN 441: August 8):

> The Nomenclature Section decided to abandon the whole concept of morphotaxa, and as a result names of fossils will be exactly like other names ... so as with fungi, the principle of 'one fossil, one name' has been adopted.

English descriptions or diagnoses permitted in 2012

The Demoulin (2010, Taxon 59: 1611) proposals to amend Art. 36 to permit the use of either a Latin or English description or diagnosis for fungi (which the Vienna Code already permitted for fossil nomenclature) were prompted by the IMC 2010 poll showing 61% support for permitting English (Norvell & al. 2010, IMA Fungus 1(2): 146).

The Melbourne Section supported Vincent's proposals so enthusiastically that a floor proposal extending permission to use English for the names of all organisms governed by the Code was also endorsed. Discussion was not on **whether** but rather **when** this should become effective, with the decision settling on January 1, **2012,** as the effective date. Setting a starting date that predates publication of the Code is unusual and underscores the wide support for removing the Latin only restriction.

Electronic publication of new names also effective in 2012

Permitting electronic-only publication of names was proposed and defeated at both the 1999 St. Louis and 2005 Vienna Congresses. However, technological advances combined with the well-crafted proposals by the Special Committee on Electronic Publication (2010, Taxon 59: 1907–1908) has been met by growing support in the mycological community for effective electronic publication of names (Norvell & al. 2010, Taxon 59: 1867–1868. 2010; Norvell 2011, Taxon 60: 611).

After considerable discussion, the Section approved electronic publication of new names, effective January 1, 2012. Nature Online hailed the passing vote as "Botanists shred paperwork in taxonomy reforms" (Cressey 2011; doi: 10.1038/news.2011.428), adding "Botanists will soon be able to name new plant species without ever physically printing a paper, as the code governing botanical taxonomy undergoes a major shake-up." (We shall ignore for the moment that it is not taxonomy but nomenclature that was reformed as well as Nature's unfortunate focus on 'plant' names....)

Knapp, McNeill & Turland have prepared an excellent explanation addressing what does — and what does not — constitute effective electronic publication under the new rules. They note that to be effectively published online, electronic material must be in PDF format, published in journals and books with ISSN/ISBN, and bear the publication date; they further note that fungal names must now include an identifier citation in the protologue for valid publication and that English descriptions or diagnoses are now permitted. Arrangements have been made to publish their important paper simultaneously in numerous journals. Mycotaxon will first post the paper on its website (www.mycotaxon.com) on the date now designated (September 14) and later publish it formally in Mycotaxon 117, the July–September volume.

'Registration' of fungal names

Both the Edinburgh IMC (Norvell & al. 2010, IMA Fungus 1(2): 146) and the NC for Fungi (Norvell 2011, Taxon 60: 612) supported requiring pre-publication deposit of key nomenclatural information in a recognized repository for valid publication of fungal names, as proposed by Hawksworth & al. (2010, Taxon 59: 1297). The proposals sought to require deposition of names and other information, recommended deposit of minimal information elements, accession identifiers and bibliographical details, and required a repository identifier.

These proposals, regarded by many in Melbourne as a re-emergence of the 'registration' proposals roundly defeated at the 1999 St. Louis Congress, engendered considerable discussion. Nonetheless, it appeared that even the more conservative delegates were content to have fungi to serve as a test 'registration' case, particularly in light of the many mycological journals

requiring such deposition since 2005.

All three proposals passed; the two friendly amendments to Art. 37bis.1 and Art. 37bis.2 by Morris & al. (see pp. 513–517, following) were integrated as requested, although their suggested recommendation regulating the timing of deposition was regarded as unnecessary and not approved.

The Gams (2010, Taxon 59: 1627) proposal recommending the deposit of the choice between competing names or homonyms, orthography, and gender of a name in a recognized repository also passed.

Spelling and typification of sanctioned names

The proposal by Demoulin (2010, Taxon 59: 1611) to amend 15.1 was accepted. The amendment clarifies that while the spelling of a sanctioned name by the sanctioning author is conserved, it is subject to the standardization of names covered by Art. 60, thereby establishing that orthographies used in sanctioning treatments are subject to the same corrections as exist for other names.

Fungi are the only organisms covered by the ICBN that may have an original starting point date and publication as well as a sanctioning publication that once served as a starting point publication in earlier versions of the Code. The concepts of sanctioning works and sanctioned names first appeared in the 1983 Sydney Code with the addition of Art. 7.17. However, the wording of this article covering typification of names 'adopted in one of the [sanctioned] works and thereby sanctioned' could be interpreted as either allowing for typification with materials cited in the sanctioning work that were not available when the original protologue was published or requiring all materials to be expressly cited in both original protologue and sanctioning work. Although the wording was changed in the 1988 Berlin Code, enough confusion persists that some authors still feel that an effectively lectotypified name must also be conserved with the same "lectotype" due to a conflict with Arts. 9.2 and 10.2. As the sanctioned works by Fries and Persoon cover over 4500 fungal names (many still lacking types), this is not a trivial issue.

Proposals by Perry (2010, Taxon 19: 1909) and Redhead & al. (2010, Taxon 59: 1911–1913) sought to amend articles regulating the typification of names in sanctioning works in different ways: Perry sought to clarify that the work of the sanctioning author, not the original protologue, should determine typification, while Redhead, Norvell & Pennycook wanted to modify Art. 7.8 to allow for 'sanctiotypification' of sanctioned names by elements not necessarily present in the original protologue.

The four authors, joined by Demoulin, Hawksworth, and former IBC Rapporteur-général Greuter, conducted several 'frank and open' meetings to resolve these differences, during which it also became evident that the Section

seemed to greet any proposed new term with decided antipathy, suggesting that the proposed terms 'sanctiotypification' and 'sanctiotype' would be summarily rejected. Having reached consensus, the authors and consultants agreed to withdraw their published proposals in favor of the modified proposals below read from the floor by Norvell.

Reword Art. 7.8 and insert after Art. 8.1

Art. 8.1bis. **The type of a name of a species or infraspecific taxon** adopted in one of the works specified in Art. 13.1(d), and thereby sanctioned (Art. 15), may be **selected from among the elements** associated with the name in **the protologue and/or the sanctioning treatment**.

Add a sentence to Art. 9.2:

Art. 9.2: A lectotype is a specimen or illustration designated from the original material as the nomenclatural type in conformity with Art. 9.9 and 9.10, if no holotype was indicated at the time publication, or if it is missing, or if it is found to belong to more than one taxon (see also Art. 9.12). **For sanctioned names, a lectotype may be selected from among elements associated with either or both the protologue and the sanctioning treatment.**

Amend Art. 10.2

Art. 10.2. If in the protologue of the name of a genus or of any subdivision of a genus the holotype or lectotype of one or more previously or simultaneously published species name(s) is definitely included (see Art. 10.3), the type must be chosen (Art. 7.10 and 7.11) from among these types unless**: a)** the type was indicated (Art. 22.6, 22.7, 37.1 and 37.3) or designated by the author of the name**; b) the name was sanctioned, in which case the type may also be chosen from among the types of species names included in the sanctioning treatment.** If no type of a previously or simultaneously published species name was definitely included, a type must be otherwise chosen, but the choice is to be superseded if it can be demonstrated that the selected type is not conspecific with any of the material associated with the protologue **or associated with a name in a sanctioning treatment.**

Amend Art. 10.5:

Art. 10.5. The author who first designates a type of a name of a genus or subdivision of a genus must be followed, but the choice may be superseded if *(a)* it can be shown that it is in serious conflict with the protologue **(or, for a sanctioned name, typified under Art. 8.1bis, with the sanctioning treatment)** and another element is available which is not in conflict with the protologue **(or sanctioning treatment)**, or *(b)* that it was based on a largely mechanical method of selection.

Add a new Article:

Art. 48.1bis. Where a sanctioning author accepted an earlier name but did not include, even implicitly, any element associated with its protologue, or when the

protologue did not include the subsequently designated type of the sanctioned name, the sanctioning author is considered to have created a later homonym, treated as if conserved under Art. 15.1.

Passage of the floor proposals effectively removes the current Art. 7.8 and clarifies that sanctioned names should be lectotypified (not neotypified) from elements associated with the name in the protologue **and/or** sanctioning treatment.

(It is with sadness that we note here the unexpected death of our newly found 'honorary mycologist' and friend, Gillian Perry, during her return journey from Melbourne to her home in Perth.)

Exclusion of microsporidians and other zoological fungi

Molecular phylogenies supporting placement of the phylum *Microsporidia* within the *Fungi* were recognized nomenclaturally five years ago in the Vienna Code (2006), with most recent papers treating the microsporidians as fungi. Carrying phylogenies into the nomenclatural realm for this group, however, can cause undesirable consequences, and in view of their long protozoan historical association and backed by the stated preference of microsporidian experts, Redhead & al. (2009, Taxon 58: 669) proposed to return microsporidian names to their 'pre-2005' status by excluding them from governance by the Code. Demoulin (2010, Taxon 59: 1628) proposed to amend Art. 45 to exclude other organisms that have been traditionally treated in other Codes. Both proposals passed after a short discussion.

Designation of type cultures

The proposal by Nakada (2010, Taxon 59: 983) to add new Rec. 8B to indicate the status of a culture when designating it as type, including the phrase 'permanently preserved in a metabolically inactive state' or equivalent passed after some discussion.

Conservation proposal recommendations accepted

Although the NC for Fungi votes on various proposals to conserve or reject names throughout the six years between congresses, it is not until the General Committee rules that these decisions become final. The General Committee (Barrie 2011, Taxon 60: 1211–1214) accepted all 44 NCF recommendations except one and has asked the NC for Fungi to reexamine the validity of *Blastocladiomycota* Doweld.

Three of the NCF recommendations accepted above were not previously reported in Mycotaxon and are listed below. (For the complete report, see Norvell 2011, Taxon 60: 1199–1201).

Prop. 1989, to conserve the name *Botrytis brongniartii* (*Beauveria brongniartii*) with a conserved type. [Minnis & al. in Taxon 60: 233. 2011]

—100% recommended conservation.

Prop. 1997, to conserve the name *Buellia subcanescens* against *B. leptina.* [Senkardesler & al. in Taxon 60: 587. 2011]

—93% recommended conservation.

Prop. 1998, to conserve the name *Lichen flavicans* Sw. against *L. flavicans* Lam. [Linda in Arcadia in Taxon 60: 588. 2011]

—93% recommended conservation.

Reconstituted Nomenclature Committee for Fungi

Each Congress selects delegates to serve on a nominating committee that appoints members to serve on the General Committee and permanent nomenclature committees; in Melbourne, Paul Kirk was selected for this Committee.

On the final day, names of members of the newly constituted committees were announced and approved by the Section. Membership of the Nomenclature Committee for Fungi has increased to 18. Returning to the Committee are Crane, Teresa Iturriaga (Caracas), Kirk, Pei-Gui Liu (Kunming), May, Jacques Melot (Reykjavik), Norvell, Pennycook, Christian Printzen (Frankfurt am Main), Redhead, Svengunnar Ryman (Uppsala), and Dagmar Triebel (München). New to the Committee are José Dianese (Brasilia), Marieka Gryzenhout (Pretoria), Martin Kirchmair (Innsbruck), Roland Kirschner (Jhongli City, Taiwan), Drew Minnis (Beltsville, MD), and Yi-Jian Yao (Beijing).

Secretary Norvell will continue to serve both the NC for Fungi and General Committee (as ex officio member). Due to a rule change limiting service on both the General and nomenclature committees to such ex officio representation, long-time members Demoulin and Hawksworth leave the NC for Fungi for the General Committee. Departure of Demoulin (who has served as Chair since 1999) means that a new Chair must be elected; the new Chair will be announced in September.

Acknowledgments

Many thanks to Sandra Knapp, James Lendemer, John McNeill, Shaun Pennycook, Scott Redhead, and Nick Turland for revisions and valuable input.